

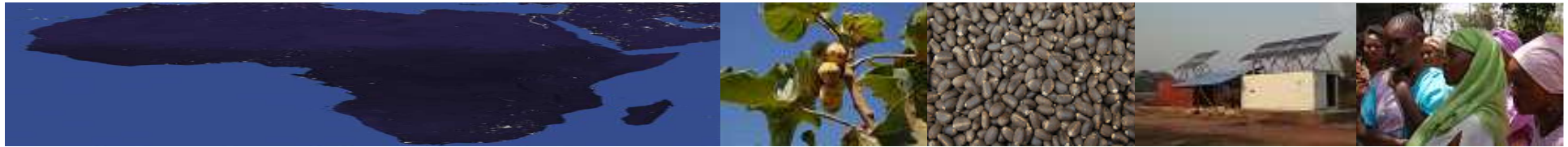
Fachtagung

Im Abseits der Netze

Dezentrale Energiegrundversorgung
in Entwicklungsländern

Bonn, 10.-12. Januar 2011

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Banarbas Mawire, Environment Africa
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The challenge at the beginning of the project:

To develop a sustainable energy system that is

- technically reliable under conditions of rural areas in developing countries;
- affordable in terms of installation and operation cost
- manageable in terms of maintenance
- socially acceptable, taking into account the local customs, specific needs and production patterns
- environmentally sound even in a long term perspective
- innovative, providing energy systems for entire villages instead of stand-alone solar home-systems
- pro-poor oriented, combining energy provision with employment generation in remote rural areas



PPP-Project Hybrid-systems for rural electrification

InWEnt – Energiebau Solarstromsysteme – Kakute – RENERG – Energiebau du Mali



Testing of alternative generators/components and refitting



2003



RENEWABLES Conference, Bonn



2004



Jatropha nurseries and cultivation in Ghana and Tanzania



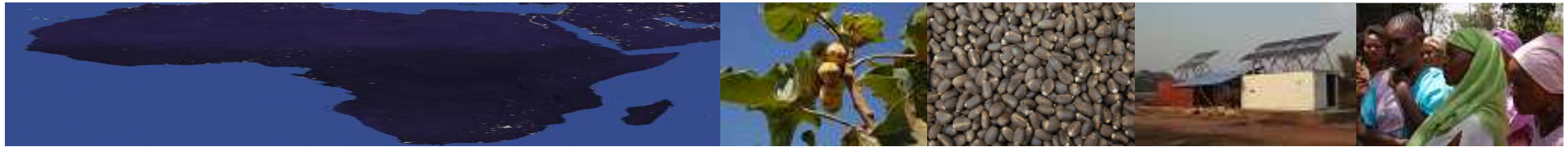
2005



Hybrid-system in Busunu / Ghana
Mbinga / Tanzania



2006



Roy Family
Award 2007,
Harvard
University



InWent-UNEP:
Eastern & southern
Africa Regional
Workshop on
Biofuels, Nairobi



Workshop for Jatropha
practitioners in Arusha



InWent Alumni-conference,
Dar es Salaam



Jatropha cultivation
training in Ghana,
Tanzania and Mali

Jatropha-generator and
solar training in Cologne

InWEnt-FAO-UNEP:
Policy Dialogue Forum:
Biofuels for Poverty
Alleviation, Nairobi

2008



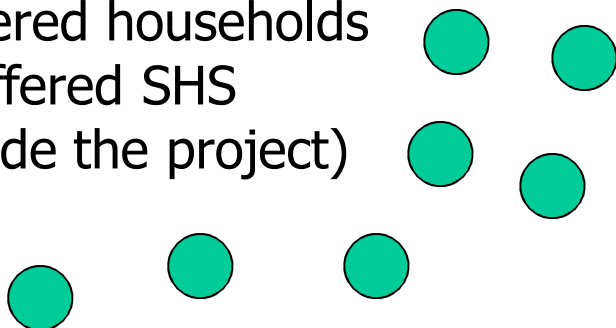
Conclusions with regard to operation & management

- hybrid-systems combining PV with generators running on straight jatropha-oil require relatively high up-front investment costs but permit 24h provision and productive use of electricity
- operational costs are lower in a long-term perspective, specially if local production of jatropha oil is possible as integrative part of drawing benefits from the whole jatropha value chain
- if lighting is required only, this can be achieved more easily concentrating on one source (pref. for generator due to high costs of batteries for buffering and their replacement)
- best cost-benefit relation using comparative advantages of the components in separated circuits for domestic use and business / social infrastructure

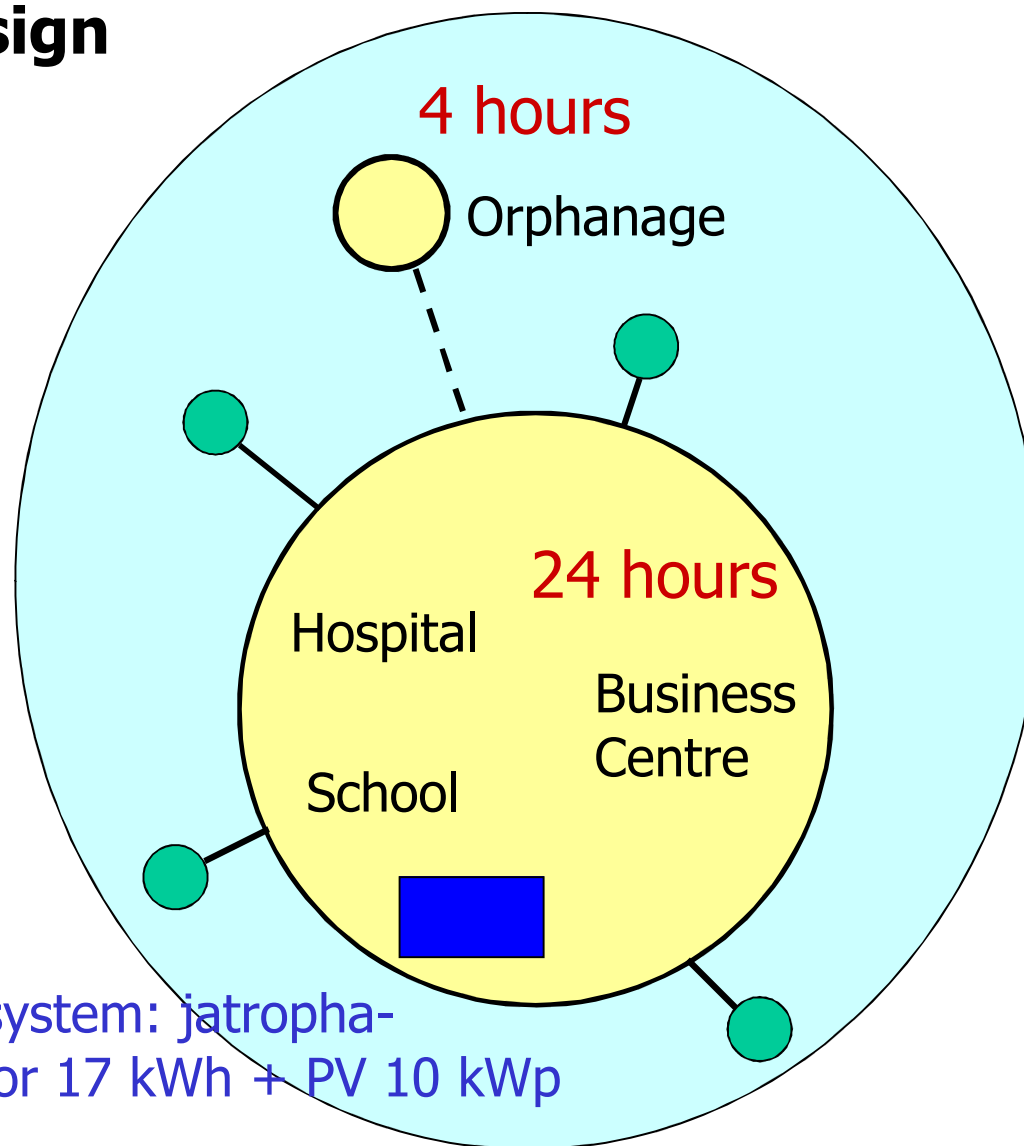


Zimbabwe project design

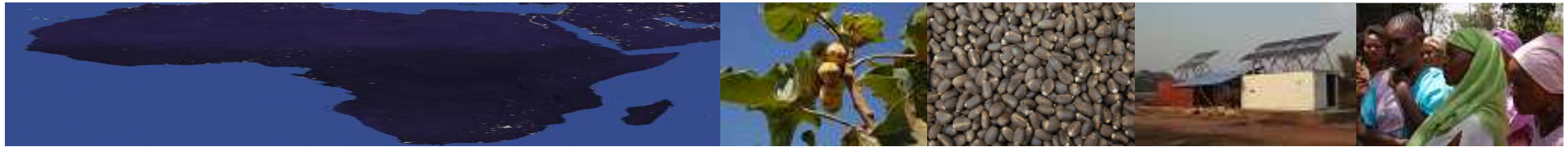
Scattered households
are offered SHS
(outside the project)



productive business	5
shops	20
teachers' homes	20
nurses' homes	10
households	30
churches	3
orphanage	5 rooms
clinic	5 rooms
2 schools	10 rooms
boreholes	5



Hybrid system: jatropha-
generator 17 kWh + PV 10 kWp



Management system

- pilot project: investment through EU funding
- private operator for operating (+ pressing of nuts) & maintaining system + collection of fee (including reinvestment costs for batteries, generator);
- local operator selected based on tendering process
- customers can pay in cash and in kind (jatropha nuts)
- farmers can sell jatropha seed to the system and get press-cake back